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ABSTRACT

This document is an addendum to the "Opportunity-to-Learn Standards for Music Instruction" published by the Music Educators National Conference (MENC) in 1994. The addendum is meant to provide specific guidance to music teachers, administrators, and other decision makers who must determine how to take advantage of new technologies in the ongoing effort to give every student a full, balanced curriculum oriented toward the skills and knowledge set forth in the National Standards. For each grade level (preK-12), the addendum lists specifications for the following: curriculum and schooling; staffing, equipment; materials/software; and facilities. (BT)

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Opportunity-to-Learn Standards for Music Technology.

Music Educators National Conference

SO 031 378

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Opportunity-to-Learn Standards for Music Technology

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Immediately following the release of the National Standards for Music Education in 1994, MENC--The National Association for Music Education released *Opportunity-to-Learn Standards for Music Instruction* as a guide to what schools should provide t o help students achieve both the National Standards for Music Education in grades K-12 and the MENC prekindergarten music education standards. MENC recommends that states either adopt these opportunity-to-learn standards or use them as a basis for develop ing their own. The standards challenge all who are committed to high-quality music instruction to work together to improve the teaching and learning of music in the nation's schools.

The writers of the opportunity-to-learn standards were well aware that new technologies have an impact on the ways schools deliver music instruction. Throughout the text of those standards, there are references to computers, software, MIDI equipment, C D-ROMs, and other resources that are important to the world of the music teacher, as well as essential to the world of music outside the classroom. In the years since the publication of the opportunity-to-learn standards, technologies useful for music edu cation (as for all education) have grown more capable, more varied, simpler to use, and certainly more ubiquitous.

This addendum to the opportunity-to-learn standards is meant to provide more specific guidance to all those music teachers, administrators, and other decision makers who must determine how best to take advantage of new technologies in the ongoing effor t to give every American student a full, balanced curriculum oriented toward the skills and knowledge set forth in the National Standards. This document does not actually call for resources beyond that seen as necessary in the Opportunity-to-Learn standar ds published in 1994; rather, it tells more specifically what equipment to buy and how to allocate those resources. For each level, specifications are listed for:

- **Curriculum and Scheduling**
- **Staffing, Equipment**

- **Materials/Software**
- **Facilities**

It is important to note that each one of these categories is important. It is, unfortunately, an all-too-common occurrence to find a school that has invested in computer hardware without the appropriate software to run on it, without appropriate facili ties in which to store or use it, and without the all-important teacher training and technical staff support that enables the school's faculty to bring the equipment's potential value to bear on the students' potential for learning.

It is essential that all schools provide a basic level of music technology equipment and software with the appropriate facilities for implementation. It is also essential that all schools provide a minimal level of training for their staff and teachers , and make an effort to effectively incorporate the technology into the music curriculum. Of course, some schools will have at their disposal sources of funding or other resources that make it possible for them to go beyond this basic level--if not with their initial implementation of music technology, then as part of an ongoing plan for devel opment. This addendum provides standards for both minimal and desirable technology programs. The minimal standards are intended to provide guidance for schools that are just beginning to incorporate technology into their music curriculum and have limited. It is the recommendation of MENC that all music programs use the desirable standards as a long-range goal.

This addendum also contains a strong, if implicit, message to decision makers connected with any of the schools or school districts around the nation that are struggling to find ways to use technology to serve the overall curriculum. That message is si mple--remember the music program. Those who give music teachers the same level of access to technological resources as teachers in other disciplines will find two things. First, they will find that the music program is greatly enhanced by innovative appli cations of technology. In addition, they will find that music offers an exciting way for students and teachers alike to make technology come alive as an innovative instrument for creative expression.

With imaginative and creative uses of technology to support a strong music program, everyone wins, especially America's students.

TECHNOLOGY STANDARDS FOR PREKINDERGARTEN AND KINDERGARTEN (ages 2-5)

Technology Standards in Context

Opportunity-to-Learn Standards for Music Instruction, published by MENC in 1994, contains a number of references to technology-based requirements for music classes at this level. The standards listed here for prekindergarten and kindergarten ins truction are meant to be an addendum to those existing 1994 standards, especially the following entries:

"Materials and Equipment

1. Every room in which music is taught is equipped with a high-quality sound reproduction system capable of utilizing current recording technology. At least some of the audio equipment can be operated by the children. Every teacher has convenient acces s to sound recordings representing a wide variety of music styles and cultures. Also available for use in music instruction are video cameras, color monitors, stereo VCRs, and multimedia equipment combining digitized sound and music with graphics and text .

2. Every room in which music is taught is equipped with a variety of classroom instruments, including...electronic keyboard instruments...."

Curriculum and Scheduling

1. Technology is used when it appropriately enhances music learning at this level.
2. Student learning experiences in the curriculum include the use of technology for singing and playing instruments, creating music, responding to music, and understanding music.
3. Software and hardware selections are made based on the learning goals established for the students.
4. Students have the same degree of access to school computer equipment for instruction in music as for instruction in other disciplines, and appropriate music software is available.
5. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

1. Technology training for teachers who provide music instruction at the prekinder- garten and kindergarten levels is conducted by people who know the needs of music learners at these levels.
2. Teachers are provided with the necessary development time for creating new curriculum materials and instructional strategies that make effective use of music technology.
3. Teachers have easy access to email and other web services for professional and curricular development, research, and other communication needs.

Equipment

Minimal:

One multimedia-ready computer is provided that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, and a CD- or DVD-ROM player.

Desirable:

1. A MIDI keyboard synthesizer or controller is connected to the computer.
2. The addition of a touch pad, large trackball, or other alternative pointing device more suitable than a mouse for children of this age.
3. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

Minimal:

The software library includes at least three titles of

instructional software that reinforces listening, understanding, and responding to music. The library also includes multimedia software that enables children to create and perform music, and permi ts musical exploration and game playing. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.

Desirable:

There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.

Facilities

Suitable space is available for one computer with appropriate power and an Internet connection in every classroom in which music is taught.

TECHNOLOGY STANDARDS FOR ELEMENTARY SCHOOL (Grades 1-5 or 1-6)

Technology Standards in Context

Opportunity-to-Learn Standards for Music Instruction, published by MENC in 1994, contains a number of references to technology-based requirements for music classes at this level. The standards listed here for elementary school instruction are me ant to be an addendum to those 1994 standards, especially the following entries:

"Materials and Equipment

1. Every room in which music is taught is equipped with a high-quality sound reproduction system capable of utilizing current recording technology. At least some of the audio equipment can be operated

Curriculum and Scheduling

1. Use of technology is a regular and integral part of instruction.
2. Teachers employ instructional strategies that appropriately utilize the unique capabilities of technology.
3. Learning experiences in the curriculum include the use of computer-assisted instruction, MIDI sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards for Music Education.
4. Software and hardware selections are made based on the learning goals established for the students.
5. Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.
6. Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.
7. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.

Staffing

Minimal:

by students. Every teacher has convenient access to sound recordings representing a wide variety of music styles and cultures.

2. In every school the following are available for use in music instruction: microcomputers and appropriate music software, including notation and sequencing software; printers; sufficient MIDI equipment; multiple electronic keyboards; synthesizers; CD -ROM-compatible computers; and music related CD-ROMs. Also available are video cameras, color monitors, stereo VCRs, and multimedia equipment combining digitized sound and music with graphics and text.

10. All equipment is maintained in good repair...."

1. A planned program of ongoing staff development to provide teachers with training in applying technology in the curriculum is in place. Training is available on a variety of levels to match the varying backgrounds and proficiencies of teachers.
2. To remain up-to-date in the field, all music educators receive at least one staff development day per year for technology training. Training is conducted by those with an awareness of the needs of music educators.
3. Teachers have easy access to email and web services for professional and curriculum development, research, and other communication needs.
4. Teachers are provided with ample time to consult with other colleagues about the use of technology.
5. Technical support and mentoring by those who are knowledgeable about the hardware and software used by music educators is available to music teachers.
6. Teachers are provided with the necessary development time for creating new curriculum materials that make effective use of music technology.

Desirable:

1. A well-planned, long-term program of professional staff-development support is available to all music teachers.
2. Music teachers have ready access to Internet-based professional development opportunities.
3. In lab settings, an appropriate student/teacher ratio is maintained through the use of teacher assistants or aides.

Equipment

Minimal:

1. Every music classroom should contain one multimedia-ready computer that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, CD- or DVD-ROM player, and a MIDI keyboard connected to the computer. When a teacher must move between classrooms and schools, a similarly equipped laptop computer is preferred for that teacher.
2. The school computer lab is equipped with dual headphones and MIDI keyboard controllers for use by the students.
3. Students have access to eight digital keyboards (possibly portable units) with standard-size, touch-responsive piano keys.
4. A large-screen video display for class presentation.

Desirable:

1. In addition to the minimal specifications, the classroom teaching station has two to three additional multimedia-ready computers with keyboard controllers (dual headphone capable). Alternatively, there is a digital keyboard lab or dedicated c omputer music lab with fifteen or more computers configured in a similar way to the workstations recommended in Number 1 above. All equipment includes powered speakers, a computer display projector, and large-capacity removable disk sto rage.
2. For instrumental instruction, alternative MIDI controllers, such as wind, guitar, string, and drum controllers, are available.
3. Music teachers have the same access to scanners, digital cameras, and other multimedia equipment as teachers in other disciplines.
4. A computer video projector to enhance class presentations in large classrooms.

Materials/Software

Minimal:

1. The software library contains at least six titles of instructional software that reinforces listening, analyzing, reading, and describing music. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.
2. At least six titles of multimedia software that enables children to create, improvise, compose, and perform music are also available. A plan to purchase three new titles each year is in place, and existing software is upgraded on a regular basis.
3. There is Internet software for supervised access to Web resources.

Desirable:

1. Additional multimedia and software titles are available, and a plan to purchase six new titles in each category each year is in place.
2. The software library contains software for generating music arrangements and accompaniments and libraries of MIDI accompaniment files.
3. There is a basic sequencing/notation package, appropriate to the age level, for recording and printing music.
4. Students have access to basic digital audio editing software for capturing, modifying, and reproducing music.
5. Music teachers have the same access to graphic,

multimedia, and Web authoring software as teachers in other disciplines.

Facilities

Minimal:

1. Suitable space is available in the dedicated music classroom for one computer with appropriate power and Internet connections.
2. Students have access to a school computer lab.

Desirable:

1. The school provides music classroom space with appropriate furniture, power, and Internet connections for multiple computer stations.

TECHNOLOGY STANDARDS FROM MIDDLE SCHOOL AND JUNIOR HIGH SCHOOL

Curriculum and Scheduling

Minimal:

1. Technology-based music instruction builds on competencies established at the elementary level.
2. Use of technology is a regular and integral part of instruction.
3. Teachers employ instructional strategies that appropriately utilize the unique capabilities of technology.
4. Learning experiences in the curriculum include the use of computer-assisted instruction, MIDI sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards.
5. Software and hardware selections are made based on the learning goals established for the students.
6. There is a minimum of one music elective course offered in which students perform with digital keyboards and/or various MIDI controllers.
7. Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.
8. Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.
9. Children with special needs have the same access to technology-based music instruction as other children

in the school. Appropriate adaptive devices are avail able as needed.

Desirable:

1. There is a minimum of one music elective course offered in which music technology shapes a significant portion of the educational experience, for example, a multimedia authoring course, composition/arranging course, or digital recording cour se.

Staffing

Minimal:

1. To remain up-to-date in the field, all music educators receive at least one staff development day per year dedicated to music technology. Training is conducted by those with an awareness of the needs of music educators.
2. An ongoing program of staff development to provide teachers with training in applying technology in the curriculum is in place. Training is available on a variety of levels to match the varying backgrounds and proficiencies of teachers.
3. Teachers are provided with ample time to consult with other colleagues about the use of technology.
4. Technical support and mentoring by those who are knowledgeable about the hardware and software used by music educators is available to music teachers.
5. Teachers are provided with the necessary development time for creating new curriculum materials that make effective use of music technology.
6. Teachers at this level have the training necessary to be able to teach and supervise music sequencing, notation, and digital audio activities.

Desirable:

1. Teachers have easy access to email and web services for professional and curriculum development, research, and other communication needs.
2. A well-planned, long-term program of professional staff-development support is available to all music teachers.
3. Music teachers have ready access to Internet-based professional development opportunities.
4. In lab settings, an appropriate student/teacher ratio is maintained through the use of teacher assistants or aides.
5. Teachers at this level have training and experience with multimedia and Web authoring.

Technology Standards in Context

Opportunity-to-Learn Standards for Music Instruction, published by MENC in 1994, contains a number of references to technology-based requirements for music classes at this level. The standards listed here for middle-level instruction are meant t o be an addendum to those 1994 standards, especially the following entries:

"Materials and Equipment

1. Every room in which music is taught is equipped with a high-quality sound reproduction system capable of utilizing current recording technology. Every teacher has convenient access to sound recordings representing a wide variety of music styles

and cultures.

2. In every school the following are available for use in music instruction: microcomputers and appropriate music software, including notation and sequencing software; printers; sufficient MIDI equipment; multiple electronic keyboards; synthesizers; CD -ROM-compatible computers; and music-related CD-ROMs. Also available are video cameras, color monitors, stereo VCRs, and multimedia equipment combining digitized sound and music with graphics and text.

6. ...The library [for the music program] contains no materials produced in violation of copyright laws.

11. An annual budget is provided for the purchase of records, CDs, and audiotape and videotape; computer and electronic materials; and the other special supplies, materials, and equipment needed for the teaching of music.

12. All equipment is maintained in good repair...."

Equipment

Minimal:

1. Every music classroom should contain one multimedia-ready computer that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, CD- or DVD-ROM player, and a MIDI keyboard connected to the computer. When a teacher must move between classrooms and schools, a similarly equipped laptop computer is pref erred for that teacher.
2. The school computer lab is equipped with dual headphones and MIDI keyboard controllers for use by the students.
3. Students have access to eight digital keyboards (possibly portable units) with standard-size, touch-responsive piano keys.
4. A large-screen video display for class presentation.

Desirable:

1. A computer video projector to enhance class presentations in large classrooms.
2. In addition to the minimal specifications, the classroom has five additional multimedia-ready computers with keyboard controllers (dual headphone capable). Alternatively, there is a digital keyboard lab or dedicated computer music lab with fifteen or more units configured in a way similar to the workstations recommended in Number 1 above. All equipm ent includes powered speakers, a computer display projector, and large-capacity removable disk storage.
3. Digital recording and CD-R capability are available.
4. For instrumental instruction, alternative MIDI controllers, such as wind, guitar, string, or drum controllers, are available.
5. Music teachers have the same access to scanners, digital cameras, and other multimedia equipment as teachers in other disciplines.

Materials/Software

Minimal:

1. The software library contains at least six titles of instructional software that reinforces listening, analyzing, reading, and describing music. A plan to purchase six new titles each year is in place, and existing software is upgraded on a regular basis.
2. Multimedia software that explores the relationship between music and the other arts and/or explores music in relation to history and culture is also a part of the library, which contains at least ten such titles.

A plan to purchase si x new titles each year is in place, and existing software is upgraded on a regular basis.

3. At least six titles of multimedia software that enables students to create, improvise, compose, and perform music are also available.
4. There is Internet software for supervised access to Web resources.
5. Students have access to ÒintelligentÓ software for enhancing practice, accompaniment, improvisation, and performance.
6. Sequencing software for recording, arranging, improvising, and composing music is available as well notation software for notating, editing, and printing music.

Desirable:

1. In addition, there is digital audio editing software for capturing, modifying, and reproducing music.
2. A plan is in place for annual purchase of new software, and existing software is upgraded on a regular basis.
3. Multimedia authoring software for Web and other student projects and reports that explore relationships between music, the arts, and society is also a part of the software library.
4. Teachers have access to administrative software for word processing, gradebook and record keeping, inventory, and equipment management control.

Facilities

Minimal:

1. Suitable space is available in the dedicated music classroom for one computer with appropriate power and Internet connections.

Desirable:

1. Practice rooms contain computer music workstations that are equipped with appropriate hardware for practice and performance and appropriate electrical and network capability.
2. There is a separate, dedicated classroom for a MIDI or digital keyboard lab with appropriate electrical and Internet capability.

TECHNOLOGY STANDARDS FOR HIGH SCHOOL

Curriculum and Scheduling

Minimal:

1. Technology-based music instruction builds on competencies established at the middle school level.
2. Use of technology is a regular and integral part of instruction.
3. Learning profiles (e.g., attendance records and progress reports) for individual students are maintained using databases and other record-keeping technologies.
4. Learning experiences in the curriculum include the use of computer-assisted instruction, MIDI sequencing, music notation software, Internet music resources, and electronic musical instruments to help students acquire the knowledge and skills listed in the National Standards.
5. Software and hardware selections are made based on the learning goals established for the students.
6. Digital keyboards and various MIDI controllers are available and are integrated into music performance ensembles where musically appropriate.
7. Music classes have the same degree of access to school technology resources, including technology labs, as other classes in the school.
8. Children with special needs have the same access to technology-based music instruction as other children in the school. Appropriate adaptive devices are available as needed.
9. Teachers employ instructional strategies that appropriately utilize the unique capabilities of technology.

Desirable:

1. Technology-based performance ensemble experiences using digital and MIDI instruments are available to students.
2. There is a minimum of one music elective course offered in which music technology shapes a significant portion of the educational experience, for example, a multimedia authoring course, composition/arranging course, or digital recording cou rse.
3. The school offers a specialized course in which students utilize appropriate music technologies in composing and arranging, recording, and producing multimedia.
4. Students use the Internet for music activities, such as conducting research, communicating with peers and authorities, and developing and publishing Web materials.

5. Distance-learning (i.e., learning through two-way audio/video conferencing or Internet-based systems) experiences are part of the curriculum. As course offerings via this delivery system become available, music instruction is included on an equal basis with instruction in other subject areas.

Staffing

Minimal:

1. To remain up-to-date in the field, all music educators receive at least one staff development day per year dedicated to music technology. Training is conducted by those with an awareness of the needs of music teachers.
2. A planned program of staff development to provide teachers with training in applying technology in the curriculum is in place. Training is available on a variety of levels to match the varying backgrounds and proficiencies of teachers.
3. Teachers are provided with ample time to network with other colleagues about the use of technology.
4. Technical support and mentoring by those who are knowledgeable about the hardware and software used by music educators is available to music teachers.
5. Teachers are provided with the necessary development time for creating new curriculum materials that make effective use of music technology.
6. Teachers at this level have the training necessary to be able to teach and supervise music sequencing, notation, and digital audio activities. In schools that have a music faculty of at least three teachers, one receives specialized tra ining as a music technology mentor.
7. Teachers have easy access to email and web services for professional and curriculum development, research, and other communication needs.

Desirable:

1. A well-planned, long-term program of professional staff-development support is available to all music teachers.
2. Music teachers have ready access to Internet-based professional development opportunities.
3. In lab settings, an appropriate student/teacher ratio is maintained through the use of teacher assistants or aides.
4. Teachers at this level have experience with multimedia and Web authoring.

Technology Standards in Context

Opportunity-to-Learn Standards for Music Instruction, published by MENC in 1994, contains a number of references to technology-based requirements for music classes at this level. The standards listed here for high school instruction are meant to be an addendum to those 1994 standards, especially regarding the following entries:

"Materials and Equipment

1. Every room in which music is taught is equipped with a high-quality sound reproduction system capable of utilizing current recording technology. Every teacher has convenient access to sound recordings representing a wide variety of music styles and cultures.

2. In every school the following are available for use in music instruction:

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microcomputers and appropriate music software, including notation and sequencing software; printers; sufficient MIDI equipment; multiple electronic keyboards; synthesizers; CD -ROM-compatible computers; and music related CD-ROMs. Also available are video cameras, color monitors, stereo VCRs, and multimedia equipment combining digitized sound and music with graphics and text.

5. ...The library [for the music program] contains no materials produced in violation of copyright laws.

10. All equipment is maintained in good repair...."

Equipment

Minimal:

1. Every music classroom should contain one multimedia-ready computer that is Internet capable and includes: audio in/out capability, General MIDI sound generation, powered speakers, CD- or DVD-ROM player, and a MIDI keyboard connected to the computer. When a teacher must move between classrooms and schools, a similarly equipped laptop computer is pref erred for that teacher.
2. The school computer lab is equipped with dual headphones and MIDI keyboard controllers for use by the students.
3. Students have access to eight digital keyboards (possibly portable units) with standard-size, touch-responsive piano keys.
4. A large screen video display for class presentation.
5. Each teacher has access to a computer (workstation or laptop) for administrative purposes.

Desirable:

1. A computer video projector to enhance class presentations in large classrooms.
2. In addition to the minimal specifications, the classroom teaching station has five additional multimedia-ready computers with keyboard controllers (dual headphone capable). Alternatively, there is a digital keyboard lab or dedicated comput er music lab with seventeen or more units configured in a way similar to the workstations recommended in item 1 above. All equipment includes powered speakers, a computer display projector, and large-capacity removable disk stora ge.
3. Digital recording and CD-R capability are available.
4. For instrumental instruction, alternative MIDI controllers, such as wind, guitar, string, drum controllers, are available.
5. Music teachers have the same access to scanners, digital cameras, and other multimedia equipment as teachers in other disciplines.

Materials/Software

Minimal:

1. The software library contains at least six titles of instructional software that reinforces listening, analyzing, reading, and describing music. A plan to purchase six new titles each year is in place, and existing software is upgraded on a regular basis.
2. At least ten titles of multimedia software that

explores the relationship between music and the other arts and/or explores music in relation to history and culture are available. A plan to purchase six new titles each year is in plac e , and existing software is upgraded on a regular basis.

3. At least six titles of multimedia software that enables students to create, improvise, compose, and perform music are also available.
4. There is Internet software for supervised access to Web resources.
5. Students have access to ÒintelligentÓ software for enhancing practice, accompaniment, improvisation, and performance.
6. Sequencing software for and recording, arranging, improvising, and composing music with digital audio capability is available, as well as notation software for notating, editing, and printing music.
7. Teachers have access to administrative software for word processing, gradebook and record keeping, inventory and equipment management control, and, where appropriate, band charting.
8. Multimedia authoring software for Web and other student projects and reports that explore the relationships between music, the arts, and society is also a part of the software library.

Facilities

Minimal:

1. Suitable space is availab'e in each dedicated music classroom or rehearsal room for one computer with appropriate power and network connections.
2. Students have access to a general computer lab.

Optimal:

1. Practice rooms contain computer music workstations that are equipped with appropriate hardware for practice and performance and appropriate electrical and network capability.
2. There is a separate dedicated classroom for a MIDI or digital keyboard lab with appropriate electrical and network capability.
3. One room is dedicated to computer-based recording and composing.

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